

ON PYRGULOPSIS, A NEW GENUS OF RISSOID MOLLUSK, WITH DESCRIPTIONS OF TWO NEW FORMS.

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IN September, 1883, Mr. R. E. C. Stearns described a rissoid mollusk from Pyramid Lake, Nevada, under the name of *Pyrgula nevadensis*. His description was based, in part, upon material furnished by one of the present writers, which was, at that time, inconsiderable in amount. In the following year the form was collected in almost incredible numbers in the original locality, and studied by Messrs. Call and Beecher in as complete a manner as rather unfavorable circumstances would admit. At that time the generic reference of the species appeared to be unquestionable, and, in the absence of specimens of European *Pyrgula* for comparison, was agreed upon as probably correct. Since this later study of the Nevada form, in which the dentition was illustrated and found to be rissoid, additional data have accumulated, which appear to render impossible the original generic reference. These data consist, in the main, of a careful study of the original bibliographic matter concerning the institution of *Pyrgula* as a genus, of the discovery of at least two additional forms which seem to be congeneric with *Pyrgula nevadensis*, neither of which agree with typical *Pyrgula*, either in station or understood hypsometric range, and of certain conchologic features that appear in the following diagnosis. In the further absence of any generic group which will include these shells, it has seemed proper to institute for their reception a genus that would do no violence to their conchologic affinities or to their geographic distribution. We therefore propose the name of *Pyrgulopsis* for these forms, and define the genus as follows :

PYRGULOPSIS, *gen. nov.*

(Etymology: *Pyrgula*, and *opsis* -aspect of.)

Type, *Pyrgulopsis nevadensis* Stearns.

Pyrgula nevadensis Stearns.— Proc. Phila. Acad. Nat. Sci., 1883.

Generic characters: Shell minute, conically turreted, somewhat elongated, imperforate, unicarinate; apex acute; aperture ovate; peristreme continuous.

Operculum ovate, thin, corneous, spiral, with polar point well forward and approximating the columella.

Jaw thin, membranaceous.

Odontophore with teeth arranged in transverse rows, according to the formula $3+1+3$. Formula for denticles of rhachidian:

$$\frac{4+1+4}{1+1}.$$

Distribution: Western and South-western United States, in fresh or brackish water.

So far as known to us, the typical European *Pyrgulæ* are bicarinate or multicarinate. The type of the genus is the species described by Michelin* as *Melania helvetica*. The founders of the genus, Christoforo and Jan, described the same form as *Pyrgula annulata*, from a locality in Switzerland. Figures 11 and 12 of Plate II. are drawn from Switzerland specimens of this form.

As above defined, this genus will include the form described by Mr. John Wolf as *Pyrgula scalariformis*.† Although the first described species, it was not considered advisable to constitute this form the type of the genus. Being a post-pliocene fossil, it was impossible to indicate those characters in the animal itself which are desirable in framing an intelligible diagnosis. These have, so far as the operculum and dentition go, been studied in the Nevada form only. The remaining species to be included are, besides the type, *P. mississippiensis*, sp. nov., and *P. spinosus*, sp. nov.

DESCRIPTIONS OF THE SPECIES OF PYRGULOPSIS.

Pyrgulopsis nevadensis Stearns.

(Plate II., Figs. 1-10.)

Pyrgula nevadensis Stearns. — Proc. Phila. Acad. Nat. Sci., p. 173, figure (1883). — Call and Beecher, Am. Nat., Sept. 1884, Vol. XVIII., pp. 851-855; from this paper the present account of the dentition is copied. — Call, Bull. U. S. Geol. Survey, No. 11, 1884.

Shell small, somewhat elongated, variable, turreted, imperforate; whorls $4\frac{1}{2}$ – $5\frac{1}{2}$, strongly unicarinate on periphery, otherwise smooth; epidermis shining, light straw color or whitish, white at suture; suture deeply and regularly impressed, made conspicuous by the approximating carina; aperture very oblique, roundly ovate, with an angle on outer edge corresponding to the excavated carina, posteriorly sharply

*Magazin de Zoologie, p. 37, Plate xxxvii. (1831.)

†Vide American Journal of Conchology, Vol. V., 1869, p. 198, Plate xvii., Fig. 3.

angled, well rounded before; peritreme continuous, almost rimate, closely appressed to parietal wall.

Operculum light corneous, spiral, closely fitting the aperture.

The following account and illustration of the dentition is by Mr. Charles E. Beecher, who has devoted much attention to the dentition of this group:

“Jaw thin, membranaceous.

“Odontophore .62^{mm} in length, and .15^{mm} in width. There are usually fifty-five transverse rows of teeth, arranged according to the formula 3 — 1 — 3, which is common to the family *Rissoïdæ*.

“Rhachis distinct, occupying one-fourth the width of the ribbon. Rhachidian tooth (Fig. 1) short and broad, with the infero-lateral angles produced and slightly arcuate. On each side of the anterior face is a strong, short, conical process or basal tooth projecting outward and somewhat downward. Basal margin trilobate; central lobe truncate. Cusp curved forward, and extended into a strong denticle with four smaller ones on each side. The formula of the denticles for this tooth would, therefore, be:

$$\frac{4 + 1 + 4}{1 + 1}$$

“Body of intermediate tooth* subrhomboidal, with the infero-interior angle slightly produced and with an angulation in the margin above. From this point there is a thickening or ridge extending toward the fixed end. Peduncle longer than the body of the tooth. Upper margin abruptly curved forward and marked by seven denticles, of which the third inner one is usually the largest; the formula for this tooth may be written 2 + 1 + 4.

“Inner lateral tooth (Fig. 3) spoon-shaped, with the infero-interior margin angular. Upper anterior margin marked with a fringe of about twenty-four denticles, decreasing in length from the interior extremity. Peduncle straight, wider than the body.

“Outer lateral tooth (Fig. 4) falciform, straight along the peduncle. Anterior margin and extremity denticulated with thirty minute denticles, usually decreasing in length toward the distal extremity, but subject to some variation. The denticulate margin extends more than one-third the length of the tooth. Peduncles slender and nearly straight.

“The formula for the denticles is:

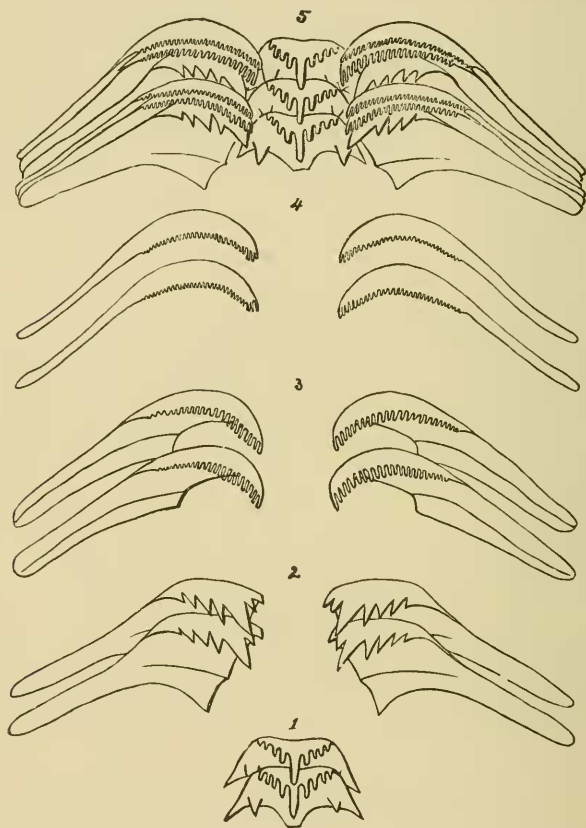
$$30 - 24 - 7 - \frac{4 + 1 + 4}{1 + 1} - 7 - 24 - 30.$$

“There is a marked variation in the character of the denticles on the intermediate and lateral teeth. On the intermediate they are large,

*It is proposed by Mr. Beecher and the senior writer to give to this tooth the name of *admedian*. In a forthcoming monograph of the *Rissoïdæ* that name will be constantly so employed.

angular, and somewhat irregular. The lateral teeth are uniformly marked by a regular fringe of slender denticles, which are much smaller on the outer lateral.

"Some portions of the membrane and different specimens show considerable variation in the length and strength of the denticles on the lateral teeth, and sometimes their number seems subject to some mutation. The numbers given in the formulæ were averaged from several enumerations, and represent the comparative denticulation of the teeth."



DESCRIPTIONS OF FIGURES.

(All figures enlarged to 500 diameters.)

- FIG. 1.—Rhachidian teeth.
 “ 2.—Intermediate teeth.
 “ 3.—Inner laterals.
 “ 4.—Outer laterals.
 “ 5.—A portion of the odontophore, representing the teeth in their natural position.

This species has a limited distribution, occurring only, so far as present information goes, in North-western Nevada, in Walker and Pyramid Lakes. Living forms have been collected only in the last-named locality.

The description of Dr. Stearns has been amended to form a diagnosis as complete as very extensive series would permit. The shell is exceedingly variable, ranging from short and stout to long and slender, and from strongly carinate to entirely smooth. Figures 6, 7, and 8 of Plate II. show the smooth forms and the variations to which they are inclined.

Pyrgulopsis mississippiensis, sp. nov.

(Plate II., Figs. 14-16.)

Pyrgula scalariformis, var. *mississippiensis* Pilsbry.—Am. Nat., Jan. 1886, p. 75. No description.

Shell minute, pupiform, elevated, imperforate; whorls $5\frac{1}{2}$ –6, flattened, with a well-marked carina on lower third, which becomes central on periphery of last whorl, body-whorl equal to one-half entire length of shell and bluntly angulated at position of carina; epidermis ———; suture distinct, deeply impressed only at commencement of last whorl and below, above last whorl covered by carina; aperture narrowly ovate, broadly rounded before and narrowly rounded behind, very oblique; peritreme continuous, almost rimate, slightly reflected over the parietal wall; lip simple, sharp.

Animal unknown.

This form has hitherto occurred only in the Mississippi River, near the mouth of Rock River, on the Illinois side — Rock Island County, Illinois. Many dead specimens have been taken, but, as yet, no living ones. It differs in important particulars from the *P. scalariformis*, Wolf, which is "carinate its entire length," has a different aperture, and is markedly different in the character of the sutures. Our species is ecarinate on all whorls above the body-whorl, the carina being depressed and filling entirely the suture. The outlines of the apical whorls are wholly unlike the figured type of Wolf's species. The average measurements of the four specimens upon which the preceding description is based are, for length, 4.66^{mm}; for breadth, 1.61^{mm}. The proportions of length and breadth, while variable, do not vary within so wide limits as the *P. nevadensis*. The individual measurements are as follows:

<i>Specimen</i>	1.—	Length,	3.58 ^{mm} ;	breadth,	1.60 ^{mm} .
"	2.—	"	3.38 ^{mm} ;	"	1.56 ^{mm} .
"	3.—	"	3.50 ^{mm} ;	"	1.64 ^{mm} .
"	4.—	"	3.40 ^{mm} ;	"	1.64 ^{mm} .

Pyrgulopsis spinosus, sp. nov.

(Plate II., Figs. 17-19.)

Shell minute, imperforate, turreted, unicarinate, carina modified into spinous processes on last three whorls, darker colored than balance of shell; whorls 5-5½, first two rounded, destitute of spines or carina, the last three somewhat geniculate, angled at location of carina, body-whorl large, sometimes with an occasional spine below the carina; epidermis light horn color, nearly white at apex, with microscopic longitudinal revolving striæ, shining; aperture roundly ovate, slightly longer than broad, rounded anteriorly; peristome not continuous, sharp, simple, slightly reflected near the columella, suggesting a faint umbilicus; suture slightly impressed.

Operculum spiral, reddish horn color.

Specimen 1.—Length, 3.86^{mm}; breadth, 2.34^{mm}.
 “ 2.— “ 3.00^{mm}; “ 1.88^{mm}.
 “ 3.— “ 3.06^{mm}; “ 1.52^{mm}.

Habitat.—Comal Creek, a clear stream at New Braunfels, Texas, on rocky bottoms. It was associated with numerous specimens of *Goniobasis pleuristriata* Say, *Amnicola* (species undetermined), and *Bythinella* (species undetermined).

In some particulars this form may be compared with Stimpson's genus *Potamopyrgus*. It differs radically, however, in the character of the spinous processes, which in that type are epidermal, while in our form they are true testaceous products. It is the only spinous rissoid described from the United States.

Pyrgulopsis scalariformis Wolf.

(Plate II., Fig. 13.)

Pyrgula scalariformis Wolf.—Am. Jour. Conch., Vol. V., p. 198, Plate xvii., Fig. 3 (1869).

“Shell turreted, slender; whorls 6, chalky white; suture deeply impressed; carinate its entire length on the lower edge of the whorls; mouth small, ovate, but slightly connected with the last whorl. Length, one-half inch.

“Post-pliocene; abundant on the Tazewell shore of the Illinois River.” (Wolf.)

No other locality has been recorded, and no living specimens have ever been taken. The figure is a copy of the original, and has been the main reliance in referring the species to this genus. We have not been able to procure from the author either the types or authentic specimens for examination.